

CLINICAL EXPERIENCE FOR THE GRADUATE
STUDENT IN PATHOLOGY AND MEDICAL BACTERIOLOGY.

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SECTION ONE.

In discussing the subject of clinical experience for the graduate student in pathology and medical bacteriology, it will perhaps be not amiss to first make a brief consideration of the relationship between the general practitioner and the clinical laboratory.

This relationship is at present undergoing an era of transition, and it can hardly be said in fairness that the present maladjustment is "a fault of the spirit." Rather let us say that it is due to that lack of concerted action which frequently accompanies a reform or the birth of a new phase of science, and thus consider it as "a fault which Time will remedy."

It must be remembered that the majority of the present-day general practitioners received during their institutional training only a comparatively small amount of laboratory experience in the above subjects, and the greater part (if not all) of that work was received as class instruction. As a result (and we are not overstating the case) the general practitioner at the present time makes but little use of the clinical laboratory as an aid to diagnosis, prognosis, and the efficiency of treatment.

The writer has met a large number (and perhaps a majority) of general practitioners who affirm "that they have no need of resorting to the clinical laboratory for diagnosis or prognosis, and that they do not value very highly the assistance of men who are far from being clinicians." In striking connection with this point we have in mind a recent verbal statement from an eminent authority and experimentalist to the effect that "he had no use for these old clinical fellows."

In the two foregoing statements we have a fair summary of what constitutes the gap between the laboratory worker and the clinician. The clinician charges the laboratory worker with a lack of necessary clinical knowledge and experience. The laboratory worker, full of pride in the immense progress and possibilities of his branch of medical science, is perhaps somewhat prone to overestimate the power of the clinical laboratory, and charges the clinician with narrowness of view and empiricism of method.

The writer, after reading a paper on this subject before a medical society, was assured by several physicians present that he was the only laboratory man they had ever heard who had any good word to say for the clinician, and who admitted that the clinician might possibly recognize a sick man when he saw one.

There is some justice in the contention of both parties. Unfortunately the general practitioner does neglect a very valuable source of information in not resorting more often to the clinical laboratory. This is partly due to each of three reasons:-

- (1) The laboratory of to-day must in many cases bear the burdens of class instruction and research in addition to the applied work of clinical diagnosis.
- (2) The laboratory worker is frequently deficient in actual clinical knowledge and experience and thus makes the practitioner skeptical as to his value as a source of assistance.
- (3) The practitioner, having received a comparatively small training in the clinical laboratory, does not in all cases appreciate the scope of laboratory assistance and the progress of laboratory technique in recent years.

Even more unfortunately, the laboratory worker merits the charge of the clinician. In all too many instances he is sadly unfamiliar with the general symptoms, character and course of the diseases which he discusses so glibly.

Perhaps the best final statement to be made on this point is that of Dr. C. P. Emerson, in the introduction to his masterly work on "Clinical Diagnosis."

"The function of the clinical laboratory worker is to aid the ward worker. The findings of the former are seldom conclusive and must be interpreted in the light of the ward findings; especially is this true now that functional diagnosis is the goal. The writer can only give to the reader who has aspirations to be a clinical chemist and microscopist the advice in substance which one of Germany's greatest clinical chemists gave him when the latter regretfully left the little Swiss laboratory which had been

such a pleasant home: the clinical chemist must be first a good clinician and second a chemist; he should remember that even from the laboratory point of view his stethoscope is of more importance than his microscope, his percussion finger than his whole outfit of clinical apparatus."

The root of the present maladjustment seems to lie in the fact that the medical student under our present system is receiving nearly all his pathology and medical bacteriology in the form of class-work, and only a small and inadequate experience in genuine clinical application. It is with this fact in view that the writer has undertaken this paper, the object of which is to suggest a means by which the general practitioner and the laboratory worker may be drawn together in concerted action and co-operation. The suggestion, expressed tersely, is that the graduate student arrange a co-operative relationship between local practitioners whereby he may obtain actual and responsible experience in clinical work and the practitioner receive the benefit of the findings.

Such a relationship should be under the advice and sanction of the departmental heads, and every step taken by the student should be done with their knowledge and authorization. As the scheme is a co-operative one, no fee need be charged for examinations, except in such cases as Wasserman's, animal inoculation, and unusually expensive culture media.

The student should refer the results of his work to a departmental authority before reporting the findings to the prac-

titioner. The responsibility involved is in many cases a very grave one, and the student should only undertake such work when he has attained an efficient degree of skill, a thorough sense of self-confidence, and a constant realization of the responsibility resting upon him. When engaged in such work, the student should keep it absolutely separate from all class-work, and, if possible, he should have a complete equipment of reagents, stains, test-tubes, slides, etc., to be reserved exclusively for clinical work, and free from any encroachment of class uses. Such an equipment should be continually gone over to see that no emergency may arise which the student may not promptly meet. There is nothing that will lose for the student the confidence of the practitioner as quickly as will an occasion where the latter comes into the laboratory with some material for examination and has to waste his time watching the former fussing around in absolute confusion, -looking for clean slides, discovering his reagent and staining-bottles empty, finding nothing but dirty test tubes etc., ad consternatum. It should be as humiliating to the laboratory worker to find his Gram's iodine bottle empty in time of need, as it would be for a surgeon in the midst of an operative clinic to discover that the most important instrument of all was missing from the instrument-table.

On the other hand, an exhibition of smooth, deft, rapid work, followed by comprehensive and precise observation, will many times not only increase the confidence of the practitioner, but also result in his recommending the work and the worker to his colleagues. "Be prepared!"

The student, when all his best efforts have brought him nothing more than perplexity, should never be afraid to say "I don't know." He cannot afford to guess or "bluff" in matters of such grave import. Inadequacy confessed is pardonable. Inaccuracy or surmise, when stated as absolute knowledge, is dishonor.

As a last ethical consideration, the student must recognize and appreciate professional reserve. Professional differences and feuds always exist in greater or less degree. The student should treat every practitioner with impartiality and avoid the slightest connection with any professional friction existing between his consultants.

The greatest difficulty which the student will encounter will, unfortunately, bear upon the prime object of this work, - namely, familiarization with the total clinical features of the cases. If this difficulty is to be overcome the student must lay stress on impressing the practitioner with the necessity of giving the student all the information he requires or, when necessary actual access to the patient. Before going to such a case, the student should consult some standard work (e.g. Osler's "System of Medicine") and make written notes from the sections on "Symptoms" or "Diagnosis", and fill out this case-examination form when making his observations. He should keep a case-book, and enter in it all available data, no matter how minute. The laboratory findings should subsequently be entered under the general date. Only by such carefully-kept written records may the student correlate the clinical picture and the laboratory findings.

The student may be surprised or even a little discouraged at the number of negative reports which he may have to send out. He should remember that a negative requires even a closer scrutiny and a more extensive examination than a positive. Dr. Cabot says that "The fact that the specimen is normal is very often of the greatest value in diagnosis and prognosis." A report of negative should be the product of even greater work than is a report of positive, and the student should bear this in mind, especially in such frequent cases as septicaemia, tuberculosis, diphtheria and typhoid. Blood-cultures should never be reported negative under twelve hours; eighteen is preferable, and unless the case is acutely and rapidly progressing, twenty-four hours should be the standard.

If a case which is clinically positive gives a negative finding subsequent material should be taken, as specimens vary greatly at times. Even in a persistent negative finding, the laboratory worker must occasionally acknowledge a clinical positive.

SECTION TWO.

The following cases represent the clinical work of the writer covering a period of three months. The examinations were conducted in the Special Methods Laboratory, Dept. of Bacteriology, University of Kansas, under the authorization of Dr. F. H. Billings, Professor of Bacteriology, and with the immediate supervision of Prof. N. P. Sherwood, Associate Professor of Bacteriology.

The writer claims no credit whatever for the work; the cases were submitted to Prof. Sherwood, and the function of the writer was simply that of an assistant. For this generously-given opportunity for valuable experience, he here expresses his heartiest thanks to Dr. Billings and Prof. Sherwood, and also to the local members of the medical profession for much co-operation and kindness.

The following list contains nearly all of the cases worked upon, with only a few of minor importance omitted.

1. Dr. F. Child, four years old. Plentiful sputum, clear, frothy, white, homogeneous. Microscopic examination made at Dr. W. — Hospital. Negative to Bordet-Gengou bacillus, and pneumococcus only present in strikingly small quantity. Clinically the case was a complication of whooping-cough and lobar pneumonia, and eventually recovered under treatment for same.

2. Dr. T. Vaughn Case. Pseudo-diphtheroid infection of cervical glands, akin to Hodgkin's Disease. As this case is one of departmental research, no further mention will be made of it here, except to state that under Prof. Sherwood's direction, the writer did morphological, cultural and immunological work upon it and some allied organisms.

3. Prof. S. Pus from a syphilitic gumma on a negro. Immense numbers of Treponema pallidum and Spirochaeta refringens present, demonstrated by a twelve-hour staining with

Giemsa's Method. Subsequent cultures made by Noguchi's Technique, which remained alive and proliferating for a known period of twelve days and possibly longer.

4. Drs. E. and H. Negress, breast-cancer. Suspected additional history of syphilis. Material taken from the lesions proved negative for *T. pallidum* by Giemsa Method. Staph. and strep. present.

5. Dr. T. Chancroid pus smears. Neg. for *T. pallidum* by Giemsa method. Clinically syphilitic.

6. Dr. E. Urethral pus smears. Neg. for gonococci, Pyogenic cocci present.

7. Dr. T. Urethral discharge smears. Gram-neg. intra-cellular diplococci present. Positive for gonorrhoea.

8. R.F. O'Donnell Case. Extensive cultural work done on organism isolated from this case and morphologically suggestive of Vaughn organism. Set aside for departmental research.

Clinically a streptococcus tonsillitis.

Recovered under argyrol treatment.

9. Dr. T. Suspected tubercular sputum. Negative by Much and Ziehl-Neelson methods.

10. Prof. S. Miss D. Made smears
and cultures from throat. Tonsillitis due to excessive bacterial
invasion, with noteworthy increase in quantity of *S. sputigenum*.
11. Dr. T. Suspected tubercular sputum. Negative
by Much and Ziehl-Neelson methods.
Negative by antiformin method.
12. R.F. Acacia Case. Smears and cultures from
throat. Negative to tuberculosis. Tonsillitis, with a long-stand-
ing glandular disease, probably tubercular.
13. R.F. 1230 Tennessee St. Infected foot, fol-
lowing friction abrasion from shoe. *Staph. aureus*, *Staph. albus*,
and a little *Strep. pyogenes*.
Infection local, no septicaemia.
14. Prof. S. Urine examination.
Some albumin (Hasting's, Heller's, Nitric)
No sugar (Almin-Nylander)
Microscopic and Cultural examination showed no casts or
bacterial pathogenesis.
15. Outside. Sputum bottle and handkerchief.
16. Dr. G. Vial of sputum.

17. Mail specimen. Referred by Miss Greenfield. Vial of Sputum.

The above three cases (Nos. 14, 15 and 16) were examined for tubercle and diphtheria bacilli by following methods: Blue, Gram, Neisser, Ziehl-Neelson, Pappenheim and Much. All were negative.

18. R.F. 1633 Vermont. Suspected diphtheria. Slight membrane. Cultures and smears. Neg. for diphtheria. Acute tonsillitis, follicular type, no prevalent incitant.

19. Dr. F. Three year old child. High fever. No rales or consolidation. Hypersensitive nervous condition. Chronically erotic. Diagnosis of acute auto-intoxication.

20. Dr. F. Man of 35. Arthritis deformans with extreme muscular atrophy, and almost total ankylosis. Chronic constipation. Case is past remedy.

21. Dr. W. Hydrocele fluid. Neg. for tubercle bacilli and gonococci. Bacterial content low and badly autolyzed.

22. Dr. W. Young man with suspected typhoid. Took blood cultures in four bouillon flasks. Negative for typhoid. Sputum culture and handkerchief from same case negative for tubercle bacilli. Diphtheroid organism present, but doubtfully pathogenic.

23. Dr. F. Woman, locomotor ataxia. Suspected history of syphilitic infection. Case was dropped for lack of sufficient data and material.

24. Dr. E. Orchitis and epididymitis. Material not very typical but sufficiently so to admit report of probable gonorrhoeal infection. Later examination clearly positive gonococci. Patient admits exposure.

25. Dr. E. Groin abscess. Suspected syphilitic lesion. Negative for *T. pallidum* by Giemsa and Romanowsky methods. Patient admits exposure.

26. Dr. T. Suspected syphilitic. Patient on K I and Neosalvarsan. Wasserman proved negative. Clinically syphilitic.

27. Dr. T. Suspected tubercular sputum. Negative by Much and Ziehl-Neelson methods.

28. Dr. T. Later examination on Case 25 Wasserman
+ or + +

29. Dr. T. Suspected syphilitic.
Wasserman negative. Malaria negative.

30. Dr. T. Suspected syphilitic.
Wasserman slightly positive. Malaria negative.

31. Dr. Trimble. This material was not for examination, but was kindly sent in as a known syphilitic serum.

Wasserman + + + +

32. Dr. W. Examination for diphtheria.

Diphtheroid organisms present, but B. diphtheriae very doubtful. No typical response to standard incubation on Loeffler's Blood Serum.

33. Dr. W. Vaginal smear. Morphologically typical B. diphtheriae present, but not tested by animal inoculation.

34. Dr. W. Suspected septicaemia. Cultures from circulation negative. Staphylococci at point of infection. Case recovered.

35. R.F. Referred by Miss Greenfield. Known case of appendicitis, probably of chronic catarrhal type. Red, White and differential count made. Reds normal. Slight leucopenia. Polymorphs. relatively low. Large lymphos and monos rather high.

36. R.F. Same case. Reds normal. Leucocytes gone up to about normal. Differential shows some relative increase in polymorphs.

37. Dr. O. Urethritis. Hypertrophy under Poupart's Ligament; enlarged inguinal lymph gland, Possible infection of prostrate gland. Patient admits exposure to gonorrhoea. Negative for gonococci.

Blood: negative for malaria.

Reds: polycythaemia, 6,200,000

Whites: slight leucopenia.

Differential: lymphocytes high
polymorphs low.

Case still pending.

38. Dr. E. Urethral discharge.

Positive for gonococcus.

39. Dr. E. Young woman, suspected epilepsy. Chronic opthalmic migraine. Certain indications of epileptic aura. No typical grand mal or petit mal. Possible condition of indicanuria. Case still under diagnostic examination.

40. Dr. K. Specimen from ear. Probably a streptococcus infection. Material still under examination.

41. Express shipment. Dog's head. Suspected rabies. Negri bodies demonstrated. Positive for rabies.

Eight cases of minor importance have been omitted from the above list, the majority of them being gross diagnosis or examinations of no laboratory interest.